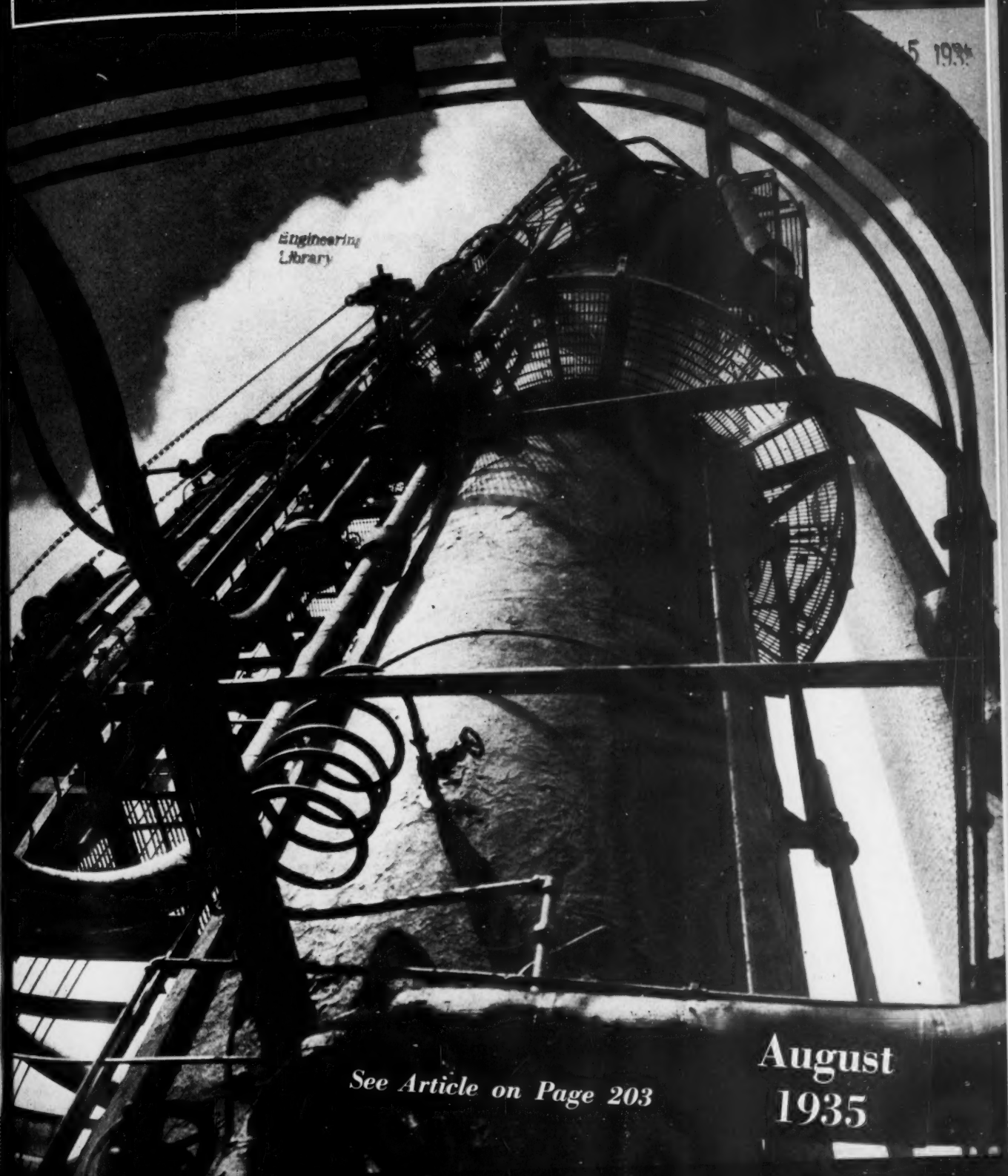
Industrial Standardization

and Commercial Standards Monthly



See Article on Page 203

August 1935

This Issue:

Front Cover: William M. Rittase, Philadelphia

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Safety Code for Pressure Piping Approved for Nation-Wide Use

by
Sabin Crocker[1]

Engineer, Detroit Edison Company

Forty national organizations cooperated in preparing the American Standard Code for Pressure Piping to serve as a guide to state and municipal authorities in drafting regulations for installation of safe pressure-piping systems, and to act as a standard reference for equipment manufacturers, architects, engineers, erectors, and others

THE demand for a nationally applicable safety code for pressure piping, acceptable to manufacturers, state safety and inspection agencies, insurance companies, and industrial engineers, has now culminated in the final approval of the American Standard Code for Pressure Piping by the American Standards Association.

The need for a general safety code for pressure piping which would correlate regulations for the design, installation, and test of piping systems with suitable dimensional standards and materials specifications was realized as far back as the early 1920's when discussions at meetings of the Sectional Committee on Pipe Flanges and Fittings of the American Standards Association indicated the desirability of such a code. Efforts of several local organizations to draft safety codes for pressure piping for their respective communities also pointed to the necessity for national uniformity of regulations.

The wide and diversified use of pipe throughout the country intensified the danger of hopeless confusion should each community decide upon local regulations. Imagine the difficulties involved for a nation-wide industry if a given article were accepted for 400-lb steam service pressure in one state, 500-lb in a second, and only 300-lb in a third! Systematic marking would be out of the question, a great deal of unnecessary duplication would be created, and the problem of stocking materials for quick shipment would be vastly complicated if not made impossible.

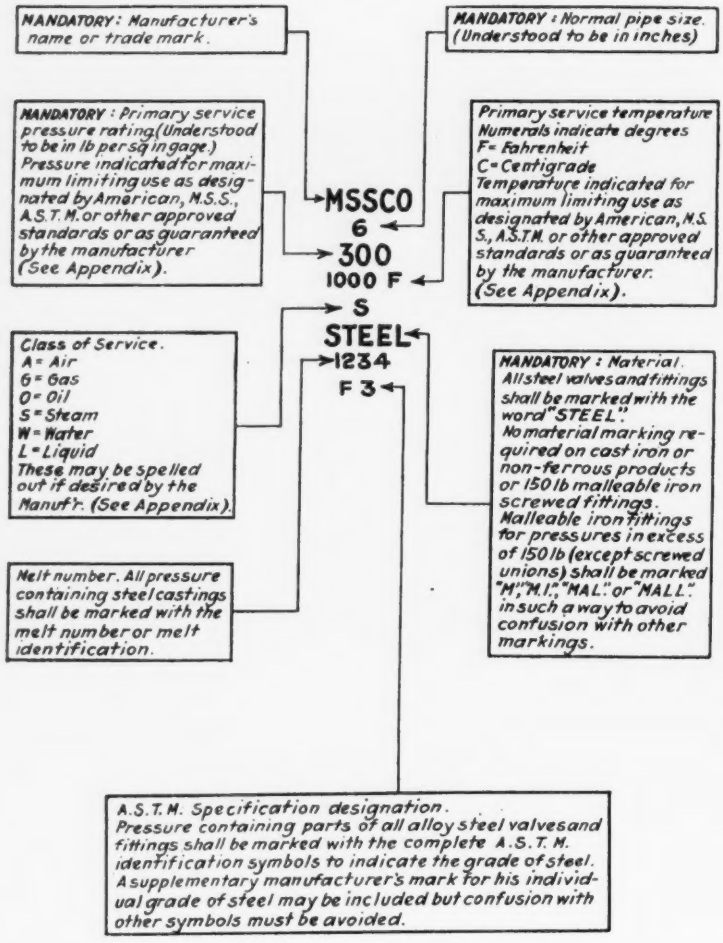
The question of setting up a national piping code was brought before the Council of the American Society of Mechanical Engineers in 1925, with the recommendation that the Society accept responsibility for this undertaking and start the necessary action leading to organization of a sectional committee under American Standards Association procedure. A letter suggesting the project was written to the ASA by the A.S.M.E. in September, 1925. In March, 1926, the ASA extended a formal invitation to the A.S.M.E. to accept sole sponsorship.

Forty organizations accepted the invitation of the sponsor to appoint representatives on the sectional committee, and participated in drafting the Code. Among the principal groups represented on the Committee are: national engineering societies; numerous trade associations; several bureaus of the federal government including those of the Navy Department and the Steamboat Inspection Service; safety engineers; inspection

[1]Member of Sectional Committee on Code for Pressure Piping representing the National District Heating Association; chairman, Subcommittee 1 on Plan, Scope, and Editing.

Our Front Cover

A gasoline cracking still, showing a part of the high-pressure piping system required for this work. Photograph by William M. Rittase, Philadelphia.



Note: Every flange, fitting, valve or cock of a size and/or shape permitting legible marking, shall have mandatory markings either cast or stamped upon the exterior surface of the product. Supplementary markings may be cast, cut, carved, stamped, engraved or otherwise indelibly reproduced upon the exterior surface or upon a plate which is securely attached to the product. (See Appendix).

Typical markings, and explanation of each, required to be cast or stamped on valves and fittings used with pressure piping.

agencies; insurance underwriters; U. S. Department of Labor; building and ship-owners associations; steel, cast-iron, and brass manufacturers; power, oil, gas, and water-supply interests; consulting engineers, and independent experts.

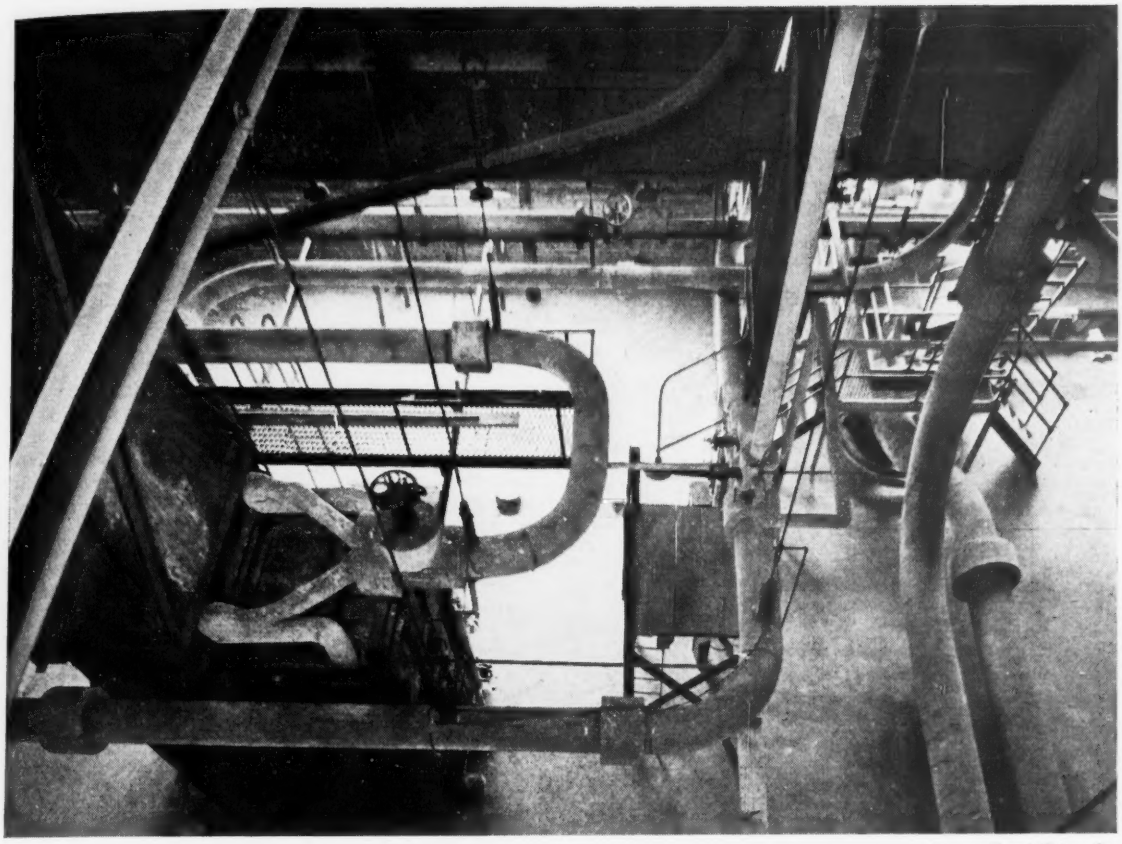
Seven years of intensive work by this sectional committee has now resulted in the approval of the new American Standard Code for Pressure Piping. Its provisions cover:

1. Choice of suitable materials and reference to specifications covering these materials;
2. Designation of proper dimensional standards and methods of fabrication for the elements comprising piping systems;
3. Listing of suitable formulas and requirements for the design of these elements and their supports;
4. Erection of piping systems; and
5. Testing of the elements before erection, and of the completed systems after erection.

The Code is primarily a safety code prescribing minimum requirements to which piping systems which carry sufficient pressure to make sub-standard piping installations dangerous must conform in order to eliminate their potential hazards. Piping installations not considered as constituting a safety hazard, such as building heating systems operating at less than 15-lb gage pressure, plumbing, sprinkler systems, roof and floor drains, sewers, and the like, are exempted from the scope of the code. All valves, fittings, and piping for boilers as prescribed in the A.S.M.E. Power Boiler Code are considered as part of the boiler installation and hence are outside the scope of the pressure piping code. Economizers, heaters, tanks, and other pressure vessels also are outside the scope, but connecting piping comes under its requirements.

It is intended to set minimum safety requirements but not to cover the best practice known to the art. While in most cases the requirements are mandatory, design recommendations have been included where they will be of assistance in securing safe piping systems.

In general, the Code is applicable only to piping systems which are to be operated at service pressures or temperatures up to the maximum limits specified for the materials covered. The maximum limiting temperature specified throughout the Code is 750 F except in the case of oil piping where temperatures as high as 1100 F are permitted in some cases. However, materials per-



Courtesy Detroit Edison Co.

Experimental 1100-F super-heater, and piping, at the Trenton Channel Plant of the Detroit Edison Company. This small installation was made to obtain information on the behavior of the super-heater and the pipe line at this extremely high temperature. Results obtained in the tests were used by the Power Piping Committee in writing this Code.

mitted in the Code for 750 F may be used at higher temperatures provided allowable stresses or ratings for temperatures in excess of 750 F are given in the Code, or specifications or American Standards referred to therein.

It is also permitted to use certain materials or products at lower temperatures with pressure ratings higher than their basic ratings provided an approved table of pressure-temperature ratings is available. Where use of materials at 750 F constitutes a hazard, such materials or products have been limited to a pressure or temperature that is commensurate with their safe utilization. Progress in the industry has been anticipated by allowing the use of new materials and construction having safety characteristics equal or superior to those specified.

Code Not Retroactive

The Code is not retroactive and does not apply to piping systems erected before, or under erection at the time of, its approval by the American Standards Association. It is expected to serve as a guide to state and municipal authorities in the drafting of their regulations, and also as a standard reference for minimum safety requirements by equipment manufacturers, architects, engineers, erectors, and others concerned with pressure piping.

The Code is subdivided into sections, each dealing with a particular kind of piping. Power piping, gas and air piping, oil piping, and district heating piping are covered. Each of these sections was prepared by a subcommittee of experts in that particular field. In addition to these subdivisions, provision was made for two sections of a general nature applying to all services, which deal with available materials specifications and fabrication details.

Preparation of a section on refrigeration piping is under consideration and it is expected that this section will be included in the second edition of the Code. Hydraulic piping has also been considered for inclusion in the requirements, but the necessary cooperation of all interests in this field has not yet been secured.

Piping Systems Defined

Power piping systems covered in Section 1 of the Code are defined as including all steam, water, and oil piping found in steam generating plants, central heating plants, and industrial plants; and as excluding gas and refrigerating piping, central- and district-heating distribution systems, building-heating piping when the pressure does not exceed 15 lb per sq inch gage, roof and floor drains, plumbing, sewers, sprinkler systems, piping for hydraulic pressure tools or equipment, and industrial process piping for fluids not mentioned above.

Section 2, Gas and Air Piping Systems, also pertains to the design, manufacture, installation, and tests of piping and its component parts, but in this case the scope covers systems intended for

Many Organizations Agree on Piping Code

Many and varied organizations, having a wide range of interest, agreed upon the provisions of the Code for Pressure Piping. The members of the committee are:

Edwin B. Ricketts*, Edison Electric Institute, *Chairman

Frederick A. Lydecker*, American Gas Association, *Secretary

American Society of Mechanical Engineers, Sponsor, *Arthur M. Houser, Alfred Iddles, C. S. Robinson, A. C. Badger (alt.)*

American Gas Association, *H. C. Cooper, Frederick Lydecker*

American Institute of Chemical Engineers, *F. J. Metzger*

American Institute of Consulting Engineers, *G. A. Orrok*

American Marine Standards Committee, *H. C. E. Meyer*

American Petroleum Institute, *C. A. Ellis, Charles Fitzgerald, J. S. Hess, A. D. Sanderson*

American Society of Refrigerating Engineers, *Alvin H. Baer*

American Society for Testing Materials, *Frank N. Speller, George H. Woodroffe*

American Steamship Owners' Association, *J. F. MacMillan*

American Transit Association, *George G. Hollins*

American Water Works Association, *Frank N. Speller*

American Welding Society, *J. L. Anderson, Alfred G. Oehler (alt.), F. C. Fyke*

Associated Factory Mutual Fire Insurance Companies, *H. B. Stewart*

Association of American Steel Manufacturers Technical Committees, *L. B. Grindlay, Thomas G. Stitt*

Association of Edison Illuminating Companies, *Abbott L. Penniman, Alexander Maxwell (alt.)*

Cast Iron Pipe Research Association, *Edward Hering, J. W. Moore, H. Y. Carson (alt.), Thomas F. Wolfe*

Compressed Air Manufacturers Association, *Henry S. Smith, H. H. Moss (alt.)*

Copper and Brass Research Association, *William G. Schneider*

Edison Electric Institute, *Edwin B. Ricketts*

Heating, Piping, and Air Conditioning Contractors National Association, *E. W. Verity*

Hydraulic Institute, *Martin B. MacNeille*

International Association of Industrial Accident Boards and Commissions, *A. L. Wilhoite*

Manufacturers Standardization Society of the Valve and Fittings Industry, *John J. Harman, F. Hugh Morehead, William Hein (alt.), Arthur M. Houser (alt.), Gus A. Daeuble (alt.)*

National Association of Building Owners and Managers, *George W. Martin*

National Association of Practical Refrigerating Engineers, *J. R. Bernd*

National Automatic Sprinkler Association, *J. Howard Williams*

National Bureau of Casualty and Surety Underwriters, *A. C. Gordon, W. M. Graff (alt.)*

National District Heating Association, *Sabin Crocker, J. H. Walker (alt.)*

National Electrical Manufacturers Association, *S. C. Osborne*

National Safety Council, *Henry S. Smith*

New England Water Works Association, *Frank N. Speller*

Ohio Society of Safety Engineers, *J. Henry Vance*

Power Piping Society, *Henry E. Haller, Geo. J. Stuart (alt.)*

Refrigerating Machinery Association, *Fred Nolde*

Society of Naval Architects and Marine Engineers, *Henry C. Meyer*

U. S. Department of Agriculture, *W. L. Edwards*

U. S. Department of Commerce, *J. L. Crone, H. L. Whittemore*

U. S. Department of Labor, *Martin McCue, William Alderman McGregory (alt.)*

U. S. Navy Department, Bureau of Construction & Repair, *Chief of Bureau*

U. S. Navy Department, Bureau of Engineering, *Officer in Charge*

U. S. Navy Department, Bureau of Yards & Docks, *L. W. Bates*

Water Works Manufacturers Association, *Howard A. Hoffer*

Members-at-large, *David S. Boyden, G. S. Coffin, S. F. Delaney, S. F. Dockstader, Harry D. Edwards, E. R. Fish, Oliver S. Hagerman, J. S. Haug, E. B. Severs (alt.), Herman C. Heaton, Frank W. Martin (alt.), Howard Hoffer, L. C. Killen, John H. Lawrence, Edward Lenz, Harold H. Morgan, William S. Morrison, Albert W. Moulder, Edward W. Norris, G. W. Satthoff, G. K. Saurwein, Clarence G. Spencer, C. C. Spreen, J. Roy Tanner, Fred H. Wagner, M. A Walker.*

conveying air, or fuel gas and illuminating gas. This section includes also the piping for city-gas distribution systems, cross-country transportation systems, piping in gas-manufacturing plants, in gas or air compressing stations, and in processing plants.

The piping systems considered in this section are grouped into two principal divisions because of the difference in hazard involved. One division pertains to gas and air piping systems constructed within the boundaries of cities and villages and in power, industrial, and gas-manufacturing plants wherever located. The other division includes gas and air piping in cross-country transportation systems and compressing stations, and other gas and air piping systems constructed outside the boundaries of cities and villages.

The distinction between Divisions 1 and 2 comes out principally in the fact that different formulas are given for the wall thickness of pipe. For Division 1 a similar set-up is used to that in Section 1, Power Piping. For Division 2 an entirely different formula based on yield strength is used for elastic materials.

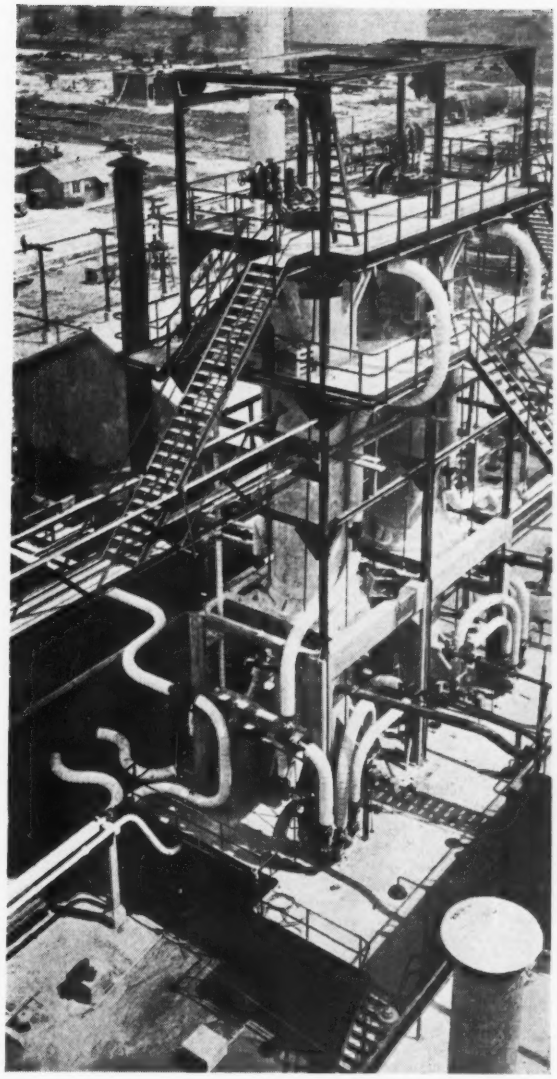
Oil Piping Standards

Section 3 covers oil-piping systems used in the production, transmission, and refining of petroleum. Oil-piping systems are defined as embracing only oil-piping, refinery-gas piping, and piping for gasoline recovery plants; and as excluding steam and water lines, refrigeration piping, and gas and air piping incidental to operation of the petroleum equipment. The Code applies to piping, valves, and fittings up to the connections to drums and pressure vessels, but does not include the connections themselves. Oil lines are classified according to pressure and temperature. Oil vapor lines follow the same classifications and specifications as oil lines. Refinery-gas lines are specifically dealt with in separate paragraphs. Refining-gas lines in receiving houses, or within 50 ft of stills and other high-temperature equipmeet, are to be constructed at least equal to Class I oil-piping requirements.

The design, manufacture, test, and installation of district-heating or central-heating piping systems used for the distribution of steam or hot water at pressures above 15 lb per sq in. gage, whether the lines are installed underground or elsewhere, are covered in Section 4. This section does not apply to equipment, apparatus, or pipe connections which are a part of apparatus, nor does it apply to low-pressure-heating piping within buildings. Piping in heat-generating plants is classified as power piping, which is covered by Section 1 of the Code.

In general the requirements for dimensional standards, materials, pipe-wall-thickness formula, etc., are identical with those of the section on Power Piping. Several important requirements applying particularly to district-heating distribution systems are included on stop valves, reducing and relief valves in consumers' premises, drains, drips, and steam traps, and test of piping after installation.

The purpose of Section 5 on Fabrication Details is to provide a set of minimum requirement standards for the fabrication of hangers, supports, and the like; the fabrication of piping joints other than welded; the welding of piping joints; and the provision for expansion and flexibility. Each of these divisions covers in considerable



Courtesy Standard Oil Development Co.

1,000 lb cracking coils in a new refinery installation

Pressure Piping Code Can Now Be Ordered

The American Standard Code for Pressure Piping is now available from the American Society of Mechanical Engineers, 29 West 39th Street, New York, or from the American Standards Association. The price of the 164-page book, containing standard regulations for selection and installation of safe pressure piping systems, is $1.00 per copy.

Members of the American Standards Association are entitled to a 20 per cent discount on copies ordered through the ASA office. They are requested to deduct their discount when paying for standards.

detail the minimum acceptable design, materials, and methods of fabrication for these items as applied in any section of the Code. The chapter on welded pipe joints was prepared in cooperation with the Pipe Welding Code Committee of the American Welding Society.

Section 6 lists standard material specifications and dimensional standards which comply with the mandatory requirements of the piping systems covered by the Code, and includes a system of product marking patterned after the Standard Practice of the Manufacturers Standardization Society of the Valve and Fittings Industry. This marking system was adopted by the manufacturers on July 6, 1934, and is to be effective July 1, 1935.

Formula Is Set Up

One of the important tasks undertaken by the sectional committee was setting up a formula for use in computing safe thicknesses of pipe for application in any of the several Code sections. This problem was referred to a special sub-group appointed for the purpose of analyzing formula requirements from all angles.

It was felt that, in a safety code, allowable stress factors (S values) should be set with reference to actual thicknesses measured on inspection rather than on average or "nominal" thicknesses given in published pipe schedules. A modified version of the Barlow formula seemed the best way to obtain reasonable simplicity, and at the same time provide for the variety of materials and end connections in common use.

Precedent for the adoption of such a formula was found in the A.S.M.E. Power Boiler Code and in the proposed pipe standard of the sectional committee on Dimensions and Materials of Wrought-Iron and Wrought-Steel Pipe and Tubing (B36). Values of wall thickness computed by use of the Barlow formula have been shown by considerable published data to be as close to theoretically correct as is warranted in the use of commercial pipe.

In order to fit the formula to the considerable variety of materials available for use in pipe, it became necessary to assign appropriate S values to each of these materials on a basis of load-carrying ability. Also, to provide an allowance for mechanical strength and/or corrosion, and at the same time accommodate the multiplicity of end connections now in common use, provision was made in the formula for a constant C representing an arbitrary increase in wall thickness, the amount of increase depending on whether the pipe was threaded, van stoned, grooved, welded, or otherwise attached. Although consideration has not been given in other American Codes to the relation of the type of end connection to the wall thickness of pipe, the increasing use of welded and other forms of plain end attachment plainly warranted this forward step.

Certain definite restrictions in applying the formula seemed to be required to govern the maximum allowable temperatures for brass, copper, and cast iron; the minimum thickness schedules where pipe is threaded; and the lowest usable values of service pressure P. The intent of the two latter restrictions is to insure having sufficient mechanical strength in low- and medium-pressure pipe, and to provide a margin for water hammer in the case of cast-iron pipe.

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Ask for Standards For Motor Parts

More than thirty automotive parts jobbers, representing regional associations of wholesalers, at their summer conference in Chicago, spent the major part of their time discussing the need for quality standards for products they handle.

The recent tendency of federal, state, and municipal purchasing departments to specify "genuine parts" in bids, *i.e.*, replacement parts made by the automobile factory or by the factory's supplier was said to have resulted from the fact that substandard parts had been manufactured and sold by some independent parts makers.

A delegate from Washington urged that steps be taken to induce manufacturers to submit their merchandise to standard tests and to adopt a "quality mark" of some kind in addition to the trade mark.

116 Approved American Standards Shown In Bolt, Nut & Rivet Institute's Handbook

Approved standards of the bolt, nut, and rivet industry have been compiled by the Committee on Standards and Technical Practices of the American Institute of Bolt, Nut, and Rivet Manufacturers and are now available in a loose-leaf volume. Standards for bolts, screws, nuts, rivets, threads, and packing are included in the volume. Illustrations are published in each standard. Of the 145 detailed standards shown in the book, 116 have been approved by the American Standards Association.

The compilation of the book was undertaken in order to assemble the present adopted standard practices of the bolt, nut, and rivet industry in one volume. It is also expected to provide a means whereby further unification can be carried on progressively so that all commercial practices of the industry may be standardized eventually.

All standards originate in the industry, and requests for standards are first tabulated by the Institute office and then sent to the members, as proposed standards, for criticism and comment. These comments then provide the basis upon which the proposed standard is revised by the Committee on Standards and Technical Practices. After revision the proposed standard is distributed to the members for final review and presentation at an open meeting of the Institute for adoption.

Standards Subject to Revisions

The adopted standards are subject to change whenever important changes occur in consumer demands, or when developments in manufacture indicate the advisability of revision in present accepted standard practices.

A section is provided in the Standards book for the insertion of proposed standards, which will be published on a different color paper from that used for adopted standards.

For approval by the American Standards Association, the Institute submits a standard which has already been approved by the bolt, nut, and rivet industry to the ASA, where it goes through the regular American Standards Association procedure. The approval of a majority of consumers and manufacturers is required before the proposed standard is certified as an American Standard.

A copy of the book can be borrowed from the office of the American Standards Association.

Half Million Lamps Certified, Illuminating Society Reports

More than 500,000 portable lamps were certified and 49 manufacturers in the United States were authorized to attach tags of certification on their lamps at the end of the first year of lamp certification by the Illuminating Engineering Society, it was announced recently.

"The portable lamp manufacturers are to be congratulated upon the cooperative spirit they have given to certification, and their willingness to accept constructive suggestions to improve their product," said D. W. Atwater, general secretary of the Society. "With the extension of certification privileges to more and more portable lamp manufacturers, with the proposed advertising program for certified lamps, and with the increasing demand for better light, the industry can expect a further increase in sales from certification."

600 National Groups are Working On American Standards Projects

More than 600 national associations, technical societies and government departments and bureaus, represented by 2,850 technologists and other experts, have cooperated in the work of 130 Sectional Committees developing American Standards and Safety Codes.

The work of these committees, classified as to their respective fields, is found in the Manual Section, pages 224 to 231 in this issue.

British Institution Shows Growth in Standards Work

Over 150,000 copies of British Standard Specifications were sold and distributed during the past year, an increase of 23,000 copies over last year, Dr. E. F. Armstrong, F.R.S., retiring chairman of the Institution, reported at the annual meeting, May 28. Seven hundred committees are now working on standardization projects under the procedure of the Institution.

British Standard Specifications are considered good propaganda for British trade, Dr. Armstrong said, and over 12,000 copies were sent to diplomatic and trade commissioners in all parts of the world. These copies are consulted by those desiring information regarding British products.

One of the most important results of the year's work, Dr. Armstrong pointed out, is the increasing success of the program of inter-Empire cooperation, now firmly established.

The Government is increasingly interested in the work of the British Standards Institution because of the growing value of its work to the Government departments, Dr. Burgin, Parliamentary Secretary to the Board of Trade, told those present at the meeting.

W. Reavell, past-president of the Institution of Mechanical Engineers, was elected chairman of the Institution for the coming year.

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Test for Determining Paint's Settling Quality

A test to predetermine the settling tendencies of a paint, particularly one freshly manufactured, has been developed at the National Bureau of Standards, says the July issue of the *Technical News Bulletin*.

This accelerated settling test was suggested as the result of the Bureau's experience with an iron oxide paint to be used as an automobile primer. The paint met the requirements of the current Federal Specification in all respects when tested at the Bureau last February. Three months later it was found to be badly settled in a hard, dry cake in the bottom of the can.

The following simple test was developed to determine the settling tendencies of a paint, and has been found satisfactory:

Pour 250-ml of the mixed paint in a 12-ounce screw-cap, glass bottle (2¼ inches inside diameter). Let stand 18 hours at 90-100 deg F. Centrifuge for ½-hour at 750 rpm at a radius of 6½ inches. Let stand 5 hours at 90-100 deg F. Centrifuge for another ½-hour at 750 rpm. Repeat this cycle for another 24 hours (48-hour test). The layer of settled pigment shall be *soft*, not hard and dry. Using a stirring rod (not over 6 mm diameter), the paint (without pouring off the liquid) shall mix within one minute to a uniform condition and give a smooth film.

The sample in question would not pass this specification, while others known to have good settling properties passed the test. For this type of paint it is estimated that the accelerated test is equivalent to about 6 months of normal shelf storage.

This test is essentially the same as that described previously by the New Jersey Zinc Company.

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Institute Confers Honors On Joseph Allen Johnson

Joseph Allen Johnson, member of the Electrical Standards Committee of the American Standards Association representing the Electric Light and Power Group, was given the honorary degree of doctor of engineering at the annual commencement exercises of Worcester Polytechnic Institute. Mr. Johnson is chief electrical engineer of the Buffalo, Niagara & Eastern Power Corporation.

The citation accompanying the degree paid high tribute to the accomplishments of Mr. Johnson in his profession since he was graduated by the Institute in the class of 1905.

Mr. Johnson is president of the American Institute of Electrical Engineers. He has contributed many valuable technical papers to the Institute, two of which have been awarded prizes.

Mr. Johnson is also a member of the American Association for the Advancement of Science and of the Edison Electric Institute.

He is at present chairman of the electrical equipment committee of the Edison Electric Institute.

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Revised Practice on Slate Is Now Out for Acceptance

A revision of Simplified Practice Recommendation R15, Blackboard Slate, is being mailed to all interests for consideration and approval by the Division of Simplified Practice of the National Bureau of Standards. The revision, which was submitted by the standing committee of the industry under the procedure of the National Bureau of Standards, consists of the addition of a requirement that blackboard slate shall be even in color and free from imperfections or veinings that will impair its use or durability as a writing surface.

The revised schedule, when adopted by those interested, will be known as Simplified Practice Recommendation R15-35, Blackboard Slate, and will remain in effect until it is revised by the standing committee of the industry.

Progress in Standardization Of Textiles and Clothing

Interest in standards for textiles and clothing has been steadily growing during the past few weeks and it is pertinent now to inquire what progress has been made in the labeling of specific goods according to standards.

Sheeting, blankets, and weighted silks were receiving considerable attention two years ago. We do not yet have sheets and sheeting on the market labeled with tensile strength, thread count, weight, amount of sizing, and shrinkage.

Unfortunately, the rules for labeling blankets formulated by producers under the auspices of the National Bureau of Standards over two years ago are not generally followed. Mention of wool content of "part wool" blankets is usually omitted, and in some cases misleading statements are used to describe composition of these products.

Likewise, weighted silks are not generally so labeled. Many misleading and deceptive practices have developed through the use of labels describing goods as "pure silk," "pure dye crepe," and the like.

Some interest has been shown in the development of standards for qualities of hosiery. Standards for describing shrinkage of wash fabrics sold by the yard have been discussed by several groups.

Very few standards were incorporated into the NRA codes of textile and clothing producers. In a few cases requirements for labeling "seconds" or "imperfects" were included. Some statements concerning composition were required by the codes of the hosiery, handkerchief, and bedding industries. The code of the underwear manufacturers provided for the use of standard sizes in labeling underwear.

It is quite evident that responsibility for developing an effective demand for standards for textiles and clothing lies with consumers of these goods. If progress is to be made in the future we must as individuals and as organized groups make definite efforts to convince producers of our need and desire for such standards.—*Jessie V. Coles, University of Missouri, at the Annual Meeting of the American Home Economics Association.*

Bureau Submits Standard On Mohair Fabrics to ASA

A Commercial Standard on Mohair Pile Fabrics, CS52-35, recently accepted by industry under the procedure of the National Bureau of Standards, has been submitted by the Bureau to the American Standards Association for approval.

The purpose of the standard is to establish standard specifications and methods of test for mohair upholstery fabrics for the guidance of producers, distributors, and users, and to provide a uniform basis for guaranteeing quality through the use of labels or certification.

The standard covers 100 per cent mohair plain velvet, 100 per cent mohair plain frieze, and 50 per cent mohair plain frieze. It provides a minimum quality for each fabric based on material, color fastness, weight of pile, construction of fabric, and treatment to prevent attack by moths.

Mimeographed copies of the standard are available from the National Bureau of Standards, Washington, D. C., or from the office of the American Standards Association.

ASA Safety Standards Recognized By Federal Advisory Committee

At the June 27 meeting of the Advisory Committee of the Division of Labor Standards, Department of Labor, it was voted that American Standards and Safety Codes would be recognized by the Division.

The resolution follows:

> "The work of the American Standards Association is recognized and its procedure accepted as the plan most advisable for the development of industrial safety standards. The Division of Labor Standards' policy is to continue its recognition of ASA Safety Standards and procedure and to undertake to supplement this work only when, and if, necessary to the rendering of the service of this Division."

The Advisory Committee, under the chairmanship of Verne A. Zimmer, was appointed by Secretary Perkins.

Draft Standard for Washers Is Being Sent to Industry

A draft standard for plain washers for use with American Standard regular bolt heads and nuts is now being distributed to industry for comment and criticism. The draft was completed recently by a subcommittee of the Sectional Committee on the Standardization of Plain and Lock Washers.

A limited number of copies of the draft can be obtained through the American Standards Association office, or from C. B. LePage, assistant secretary, the American Society of Mechanical Engineers, New York. All comments concerning the draft standard should be forwarded to Mr. LePage.

International Electrotechnical Commission Meets in Holland

by
J. W. McNair
Electrical Engineer, ASA

Special, from The Hague, The Netherlands.

THE eighth Plenary Meeting of the International Electrotechnical Commission started on June 18th in Holland, where the meetings were held at Scheveningen the first week and in Brussels the second.

At the opening meeting the delegates, who came from 20 countries, were welcomed on behalf of the Netherlands Government by His Excellency the Minister of Waterways, Mr. O. C. A. van Lidth de Jeude, who was accompanied by the Minister of Economic Affairs, and Professor Dr. Clarence Feldmann, President of the Netherlands Electrotechnical Committee and Past President of the IEC.

His Excellency, speaking in the name of Her Majesty the Queen of the Netherlands, expressed the pleasure they had in receiving delegates from so many important countries.

He reviewed briefly some of the important results already achieved by the IEC and concluded by issuing a cordial invitation to the delegates to visit the Zuider Zee works and other places of outstanding interest.

Professor Feldmann took the opportunity of referring to the origin of the IEC, and a message of goodwill was sent to Colonel R. E. Crompton at whose instigation the IEC was originally founded. Professor Feldmann stressed the idea underlying the organization of the IEC, explaining that the delegates represent the various National Committees, each of which is representative of the several interests within the industry.

Each country, he pointed out, possesses equal rights and may participate in any Advisory Committee. These committees are made up of the most competent specialists, and the results already achieved are substantial.

IEC Widely Representative

The President of the IEC, Dr. A. E. Enstrom, Sweden, in his reply thanked the Netherlands Government and Committee for their welcome. He directed attention to the fact that today the IEC embraces practically every branch of the electrical industry and from the point of view of standardization in its broadest sense is dealing with matters of the highest commercial importance, without neglecting the more theoretical aspect of electrical science. He described the IEC as the world parliament of electricians, which in its thirty years of existence has accomplished more than is generally recognized.

Recommendations Permeate Industry

Dr. Enstrom stressed the fact that although the IEC recommendations are not so much in the public eye as they might be they are constantly permeating the national standards as well as industry as a whole, where their identity or origin is often lost.

He urged all delegates to bring to the notice of their governments and authorities the achievements of the IEC.

Dr. Enstrom referred to the loss sustained by the death of Dr. C. O. Mailloux (U.S.A.) and Dr. Strecker (Germany).

Engineer N. E. H. Damme, President of the Royal Netherlands Institution of Engineers, the oldest engineering institution in the world, then spoke on the need for international understanding and the discussion of international problems, even though at the moment the times do not seem too propitious.

There were over 450 delegates present, of whom 14 represented the United States National Committee of the IEC. The U. S. National Committee is composed of the 18 members of the Electrical Standards Committee of the American Standards Association, three representatives of the American Society of Mechanical Engineers, and members at large. The American delegation is led by Dr. C. H. Sharp, President of the USNC.

The delegates to the IEC meetings have been selected by the Advisory Committees of the USNC which are in most cases sectional committees of the ASA. American industry is, therefore, participating directly in the deliberations of the IEC.

Actions of the IEC at the June, 1935, Meetings at The Hague and Brussels Concerning Electrical Units

Up to this time (June, 1935) science has employed the cgs (centimeter-gram-second) systems of physical units. Electrical units have been established in the cgs system on the electrostatic and electro-magnetic schemes of Maxwell. There have been published also numerous papers employing electrical units departing in some measure from the classical cgs systems.

The International Electrical Congresses including the International Electrotechnical Commission (IEC) have adopted at various dates since 1881 certain so-called practical electrical units, ohm, volt, ampere, farad, coulomb, henry, joule, watt and weber. These did not form an independent system but were all based upon and defined from the cgs electro-magnetic units, through numerical factors 10^9, 10^8, 10^{-1}, 10^9, 10^{-1}, 10^9, 10^7, 10^7, and 10^8 respectively.

As a result of the decisions taken at the IEC meetings just past, all these practical units, without being in any way altered, become connected into a new coherent and absolute system based upon the proposals of Professor Giorgi, first published in 1901. The system is known as the Giorgi-MKS system. It is based on the meter, the kilogram (unit of mass), and the second. In this system the above-mentioned practical units are essential constituent elements in one-to-one relation, so that the conversion factors above-mentioned need no longer be learned and memorized by students.

The Giorgi system—

(*a*) is essentially composed of units already in practical use,

(*b*) avoids the need for the complicated dimensional formulae with fractional exponents,

(*c*) recognizes the need for a fourth fundamental unit, to be selected from the existing practical electrical units,

(*d*) leaves the cgs systems and all systems used by physicists undisturbed. All these systems may be explained simply in terms of the new system.

(*e*) it permits the use of either "rationalized" or "unrationalized" formulae.

For the present, the IEC has avoided a decision on the question of "rationalization," thus leaving each author free to use the formulae which he prefers.

In addition to the above-mentioned decision on the adoption of the Giorgi system, three derived units were pointed out by way of example. These were—

(*a*) the unit of electric gradient, the volt per metre,

(*b*) the unit of magnetic flux density, the weber per square metre,

(*c*) the unit of volume energy, the joule per cubic metre.

The IEC meeting decided to endorse the IEC Oslo convention of 1930 that the permeability of vacuum μ_0 be retained in magnetic formulae as a physical quantity and not as a mere numeric. This is a fundamental part of the Giorgi System.

It was decided by the IEC that the system be known as the "Giorgi System."

American Standard Is Used In Grade Marking Cross-Ties

The grade marking of railway cross-ties by means of a stenciled brand on the end, that shows both the name of the vendor and the size, and which is being applied to hardwood ties as well as to softwood ties, is a practice that has been adopted recently by the Hobb-Western Company, St. Louis, Mo., reports a recent issue of *Railway Age*. The plan includes a guarantee of the grade in the event that ties are shipped without having been inspected before loading by the railway's inspector.

This plan was brought about as an elaboration of the practice adopted by this company some time ago of segregating serviceable rejects and No. 1 ties from the other sizes, the grade marking being confined to the No. 2, 3, 4, and 5 ties. The ties produced in the company's own operation are graded as they are manufactured, while the ties purchased from small producers are graded on the ground before loading.

It is said that this plan was adopted only after a thorough training of a corps of inspectors in the provisions of the Specifications for Cross-ties of the American Railway Engineering Association and after careful test checks had given assurance of the required uniformity in grading by all members of the staff.

The American Railway Association standard was approved by the American Standards Association as American Standard Specifications for Cross-Ties and Switch-Ties (O3-1926). Copies are available from the American Standards Association office at 25 cents.

Conference Recommends Adoption of Commercial Standard for Cast Stone

A proposed Commercial Standard for Colors and Finishes of Cast Stone was recommended for adoption by a general conference held on May 17, 1935.

The standard covers those colors and finishes which constitute a very large proportion of the production of the cast-stone industry. As the demand arises this standard may be extended to include other colors and finishes.

It is not the purpose of the standard to limit the range of colors, textures, and finishes in cast stone. Under its present scope it merely sets up tangible examples of the most frequently occurring colors and finishes. These samples provide standards of comparison by which cast stone of these particular colors and finishes can be specified and judged.

The recommended Commercial Standard provides that samples of cast stone which will be used for reference purposes by producers will be obtainable from the Cast Stone Institute which will certify that the samples are satisfactory duplicates of the master samples retained by the National Bureau of Standards. The reference samples are 4½x6½x1 in. in size.

Although not a part of the proposed Commercial Standard the Federal Specifications for Cast Stone SS-S-721 is referred to as a guide in the preparation of a complete working specification for each job.

British Railroads Economize Using Purchasing Standards

Elimination of over 25,000 items was the result when purchasing for the London Midland and Scottish Railway, and the 35 separate railways amalgamated with it, was placed upon a scientific, standardized basis, using British Standard Specifications wherever possible.

The general stores department found that there were 600 schedules of purchasable articles in existence, representing roughly 30,000 items ranging from scrubbing brushes and carriage ventilators to relays. As a result of standardization, these items were reduced to 7,000, and after further effort by the stores coordination committee, they were reduced to only 4,400, or roughly about one-seventh of the original number.

The British Standards Institution is carrying on a wide program of standards projects in which the railways are interested. Some of the committees upon which they are represented are working on standard voltages, signalling lamps, terminals, fuses, relays, electric locks, power point operation, track circuit transformers, track circuit insulations, traffic signalling symbols, glossary of signalling terms, and colored signal lenses. In addition, the Institution has just commenced a review of mechanical signalling apparatus.

Manufacturers, consulting engineers for foreign railways, the Crown Agents for the Colonies, and the Institution of Railway Signal Engineers also have representatives on the committees working on railway standards.

Standard Time Zones Are Now 51 Years Old

Few realize that our system of standard time zones, by which the continent is divided from east to west in four time areas, is only 51 years old. Prior to 1833 great confusion as to proper time existed. Towns and cities usually set their clocks by the sun.

The standard time scheme was proposed by Dr. Charles F. Dowd, a schoolmaster at Saratoga Springs, N. Y., who worked for 12 years to have it adopted. It was finally put into practice on November 18, 1883. But Mr. Dowd got little credit; and for years afterward in many conventional homes it was considered almost irreligious to observe standard time rather than "the Lord's own sun time."—*Literary Digest.*

Suggests Europe Agree On Motor Regulations

The Continent's mass of motoring regulations—each country has its own idea of how things should be done—are proving a stumbling block. An effort is to be made to straighten things out somewhat.

For instance, Germany limits the width of heavy-duty commercial vehicles, carrying loads up to seven tons, to 2m 50cm. In France, the limit of width has recently been reduced from this figure to 2m 35cm. Belgium sets the limit at 2m 40cm. The diversity of maximum permissible width, a matter of capacity in which manufacturers want to give the user the fullest load space possible, makes things difficult for factories.

It is suggested in Belgium that some uniform standard should be adopted. This principle has long been recognized as essential to progress. Whitworth standard threads, metric threads, wheel and tire sizes, and many other standards, have been generally accepted and have reduced confusion to simplicity.—*Natal Mercury, Durban, S. A., Jan. 23.*

Comments Are Requested On Proposed Gage Standard

Drafts of the proposed American Standard on Accuracy and Test Methods of Pressure and Vacuum Gages have been circulated for criticism and comment.

This tentative draft deals with dial ranges, requirements for accuracy for different services, method of expressing degree of accuracy, methods of testing (calibration standards and test procedure), and graduations, markings, and width and length of pointer.

The standardization of accuracy and test methods is one of four subdivisions of the project assigned to the sectional committee on the standardization of pressure and vacuum gages. This committee is working under the procedure of the American Standards Association, with the American Society of Mechanical Engineers acting as sponsor.

Copies of the draft standard can be obtained from the American Standards Association, or from C. B. LePage, Assistant Secretary, American Society of Mechanical Engineers, 29 W. 39th Street, New York. Comments and suggestions concerning the proposed standard should be mailed to Mr. LePage.

Radio Corporation Becomes ASA Member

The Radio Corporation of America, which joined the American Standards Association nearly 10 years ago, has reaffiliated as a Company Member after being out of the work for the past two years. Executives and engineers of the Corporation are at present representing various electrical associations on six projects.

Industry Amends Standard For Fiber Insulating Board

The Division of Trade Standards of the National Bureau of Standards announces that the standing committee of the industry has reaffirmed Commercial Standard CS42-32 for Fiber Insulating Board with an amendment permitting a lower drying temperature preparatory to determining thermal conductivity. The change in the method of test does not noticeably change the thermal conductivity.

Mimeographed copies of the standard can be obtained from the Division of Trade Standards, National Bureau of Standards, Washington, D. C., or through the office of the American Standards Association.

Crowds Plus Carelessness

When a box full of snakes on exhibition was opened accidentally on an amusement pier at Winnwood Beach, near Kansas City, this week, there was a panic in the crowd, and a section of the pier collapsed, dropping people eighteen feet into a stretch of mud, and injuring fifty. Most of these were hurt from trampling, though one child was treated for snake bite.

Only a few days before, at Flemington, New Jersey, a new grandstand collapsed from the weight of a crowd watching a bicycle race.

That same day, at a baby contest in an amusement park at Nanticoke, Pennsylvania, the floor gave way, throwing more than 200 persons, including the babies and several shelves of crockery and glassware, into a creek.

Accidents of this kind occur frequently during summer months, usually where some temporary, poorly built structure becomes overcrowded.

As one preventive measure, standards for grandstand construction have been drawn up by a committee of the American Standards Association.

But national building standards cannot easily be designed to cover the numerous causes that enter into the collapse of grandstands. The human element is usually at the bottom. In the accident at Nanticoke, rain caused the crowd to burden the pavilion beyond its safe capacity. Overcrowding, itself, is a result of negligence on the part of those responsible for operating an amusement requiring a grandstand or pavilion.

Apparently one safe rule is to provide for the emergency of panic wherever crowds are to be handled, whether the possible cause be considered as the weather or a box of snakes. The engineers who can draw up a reasonably safe set of construction standards for grandstands have no assurance that their expert advice can be written into laws and enforced.—*New York Sun, July 6.*

British Industry Uses Pipe Standards

Revision of the British Standard for Pipe Threads, originally issued in 1905 and revised in 1909, is being considered by the British Standards Institution. British Standard Pipe Threads, including both taper and parallel male and female threads of the rounded Whitworth 55 deg form, for pipes from $\frac{1}{8}$ in. to 18 in. nominal bore, have been widely adopted by British industry.

Other British standards affecting pipe are those on standardization of pipe flanges, covering flanges for pressures from 30 to 1,400 lb per sq in. for pipes from $\frac{1}{2}$ in. to 72 in. nominal bore, and providing for the use of bronze, cast and wrought iron, and cast and forged steel.

Specifications to control the quality of tubes and fittings have also been agreed upon by committees of the British Standards Institution.

National specifications for screwed and socketed steel and wrought-iron pipes are now being prepared by the Institution.

Revisions of two existing British Standard Specifications for a standard range of fittings suitable for pressures up to 200 lb (water) or 125 lb (steam or gas), one for malleable and soft cast-iron fittings, and the other for long sweep malleable iron fittings, are now being revised.

In order that the user of pipe can be sure that his purchases conform to British Standard Specifications, the British Standards Institution grants the use of the B.S.S. mark, provided proof is submitted that the products are manufactured in strict conformity with the British Standard requirements. The use of the mark is not confined to standard pipe. It can be used on any product which conforms to British Standards Institution requirements.

Available at ASA Office

British Standard Specifications on Tubes and Fittings, published by the British Standards Institution, can be ordered through the office of the American Standards Association. They are:

B.S.S. No. 10:	Parts 1-5, Pipe Flanges
B.S.S. No. 21:	Pipe Threads
B.S.S. No. 143:	Long Sweep Type Malleable Iron Pipe Fittings for Water, Gas, and Steam
B.S.S. No. 154:	Malleable and Soft Cast Iron Pipe Fittings for Water, Gas, and Steam

Other specifications affecting the purchase of pipe in Great Britain are: Institution of Gas Engineers' Specification for Wrought-Iron Tubes and Strip; Model By-Laws and Regulations of the British Waterworks Association for the Prevention of Waste, Misuse and Contamination of Water; Ministry of Health Model Specification for Water Pipes and Fittings.

Research Pamphlets Discuss Sampling

A new research pamphlet, *The Use of Range in Place of Standard Deviation in Small Samples*, has been prepared by E. S. Pearson and Joan Haines. The pamphlet, which is a reprint from a supplement to the Journal of the Royal Statistical Society, and is published for private circulation, gives statistical tables and charts to prove the authors' contention that the use of the range chart is simpler than the use of the standard deviation chart, and that it can safely be used under certain conditions.

A more general discussion by E. S. Pearson, also reprinted from the Journal of the Royal Statistical Society for private circulation, is contained in the pamphlet, *Sampling Problems in Industry*. The pamphlet contains the discussion on this subject before the Industrial and Agricultural Research Section of the Royal Statistical Society, and contains the paper presented by Dr. Pearson at that meeting, as well as the discussion following the presentation of the paper.

Both pamphlets can be borrowed from the American Standards Association Library.

Asks Federal Auto Law To Await ASA Standards

A formal request that the House of Representatives delay action on a bill which provides for compulsory mechanical inspection of motor vehicles of the District of Columbia was embodied in a letter to Representative Mary T. Norton recently. The letter was signed by George E. Keneipp, manager of the Keystone Automobile Club.

The automobile club asked that no action be taken until the submission of a report from the committee on Standards for the Inspection of Motor Vehicles of the American Standards Association. This committee is now being organized to make an exhaustive inquiry into suitable standards for the inspection of motor vehicles.

In view of the technical knowledge which the subject requires, the Keystone Automobile Club hopes that the House of Representatives will comply with its request and await expert advice, says an article in the *Washington Post*, July 13.

A.S.T.M. Annual Meeting Acts On New Standards and Revisions

150 Committee Sessions Attended by More than 1,000 at Detroit

MORE than 1,000 members of the American Society for Testing Materials and other technical men interested in the standardization and research work of the A.S.T.M. registered at the 1935 annual meeting in Detroit, June 24-28. Approximately 150 committee meetings were held during the week.

As a result of the meeting, some 39 new proposed specifications are to be published as tentative, 22 existing tentative standards will be balloted upon for adoption as official standards, and over 85 standards and tentative standards will be tentatively revised. Previously existing revisions in some 16 standards are to be adopted as standard.

A number of committees finished work on new specifications which will be submitted to letter ballot of the entire committee memberships and submitted to the Society during the summer to be published as tentative.

New Steel Specifications

New specifications developed by the A.S.T.M. committee A-1 on Steel, covering axle-steel concrete reinforcement bars and seamless low-carbon steel still tubes for refinery service, were approved as tentative standards. The committee will also submit five new specifications to the Society during the summer as a result of its meeting in Detroit. These cover carbon and alloy-steel castings for railroad service, seamless cold-drawn steel heat exchanger and condenser tubes, forged steel pipe flanges for general service, alloy-steel forgings for temperatures up to 1100 F and nuts for high-temperature and high-pressure service.

As a result of considerable demand for separate specification requirements for automotive gray-iron castings, Committee A-3 on Cast Iron has developed these in cooperation with the Gray Iron Committee of the Society of Automotive Engineers. The specifications have been approved as S.A.E. standards by the Society of Automotive Engineers. The new specifications pertain particularly to strictly automotive products, and are intended to supplement, not displace, existing gray iron specifications as developed by the American Society for Testing Materials and the American Foundrymen's Association.

Four new specifications, the first to be developed by Committee A-10 on Iron-Chromium-Nickel and Related Alloys, were presented by this Committee. They cover soft corrosion-resisting cromium nickel steels (sheets, strips, and plates), and 12 per cent, 19 per cent, and 28 per cent chormium-steel castings.

Committee B-1 on Copper Wire recommended several important tentative revisions in three of its standards. In B 8-27, covering bare concentric-lay copper cable, a new stranding table for concentric-lay cables will be given, and in order to meet the pressing need for testing of cable in its completed form, changes agreed upon permit testing of the cable as an alternative to individual strand tests.

New tentative specifications for lead-coated copper sheets for architectural uses were presented by Committee B-2. They are supplied in two types according to method of manufacture and in three classes according to weight of coating.

New specifications covering copper-silicon alloy wire were approved as tentative on the proposal of Committee B-5 on Copper and Copper Alloys, Cast and Wrought. The specifications were prepared as a result of a demand for a specification to cover material now being sold and used extensively for various structural purposes. The wire in question is well adapted to the making of bolts, screws, nails, rivets, springs, or other structural members requiring a material of high strength and high corrosion resistance.

New specifications for lead and tin-base alloy die castings have been prepared by Committee B-6 on Die-Cast Metals and Alloys, and will be issued as a tentative standard. Five typical alloys are specified, designated as Grades 1 to 5 in order of decreasing tin content.

Two new methods for analyzing cements for magnesia were given in detail in the report of the Working Committee on Methods of Chemical Analysis of Committee C-1 on Cement. Twenty-four laboratories are cooperating in further in-

Committee Proposes Standards For Plated Coatings on Steel

The first proposed standards issued by the American Society for Testing Materials relating to plated coatings on steel have been prepared by Committee A-5 on Corrosion of Iron and Steel, in cooperation with the American Electroplater's Society and the National Bureau of Standards. The three new specifications cover electrodeposited coatings of zinc, of cadmium, and of nickel and chromium on steel.

These specifications will be useful in setting up minimum requirements for plated coatings designed for the types of service classified in the specifications.

It is expected by the Society that comments will be received following publication of the specifications as tentative standards, and as a result, that subsequent revisions may be desirable.

Critical comments on the tentative specifications are desired by the committee.

vestigations and. on the basis of data so far obtained, it is likely that a satisfactory quick method can be developed.

Tentative revisions were recommended by Committee C-3 on Brick in two of its standards—specifications for building brick, and methods of testing brick.

Committee C-4 on Clay Pipe recommended the adoption as standard of the Tentative Specifications for Clay Sewer Pipe (C 13-33 T). These will be submitted to letter ballot of the Society during the summer.

Several new tentative standards were submitted to the A.S.T.M. earlier in the year by Committee C-8 on Refractories. This committee also sponsored the publication of the widely used manual, *A.S.T.M. Standards on Refractory Materials.*

Committee C-9 on Concrete and Concrete Aggregates reported the development of three new proposed standards which will be published as tentative. These cover compression tests of concrete, a method of test for the determination of voids in coarse aggregate for concrete (dry rodded), and a method of test for determining the total quantity of material finer than a standard No. 200 (74-micron) A.S.T.M. sieve in aggregates.

Proposed Specifications for Concrete Irrigation Pipe will be published as tentative on the recommendation of Committee C-13 on Concrete Pipe. The committee also proposed the adoption as standard of the existing Tentative Specifications covering Non-Reinforced and Reinforced Concrete Sewer Pipe, respectively. The Society will ballot on this recommendation during the summer.

"E.P.L." and "Oiliness" Sections

Technical Committee B on Motor Oils of Committee D-2 on Petroleum Products and Lubricants created two new sections for the study of "Extreme Pressure Lubricants" and the "Oiliness of Motor Oils", and formed a new subcommittee to develop test methods which are peculiarly applicable to plant spray oils.

Consideration was given to minor changes in the Diesel-Fuel Oil Classification which was published last year for information, in the description of the test for gravity by means of the hydrometer (D 287-33) and in the draft of the proposed tentative revision of the Standard Methods of Test for Viscoscity of Petroleum Products and Lubricants (by means of the Saybolt Viscosimeter) (D 88-33).

The Subcommittee on Natural Gasoline has prepared a tentative method of test for the vapor pressure of motor and aviation gasoline (Reid method) which will be formally submitted to the membership of the committee for approval this year.

Committee D-4 on Road and Paving Materials joined Committee D-8 on Bituminous Waterproofing and Roofing Materials in recommending that the tables designated as Group 0 and Group 1 in the Standard Abridged Volume Correction Table for Petroleum Oils (D206-34) be tentatively approved as a Volume Correction Table for Asphaltic Products. These tables are now in common use in the asphalt industry. The committee also proposed as tentative a method of test for determination of amount of material finer than No. 200 sieve in aggregates.

Nine Highway Soil Tests

The Subcommittee on Soils for Highway Construction, which was organized during the past year, has prepared nine new methods of test for soils covering the following: surveying and sampling; preparing soils for test; liquid limit; plastic limit; plasticity index; centrifuge moisture equivalent; shrinkage factors; field moisture equivalent; mechanical analyses. (It is expected that these will shortly be submitted to letter ballot of Committee D-4.)

Committee D-5 on Coal and Coke recommended four new proposed standards which will be issued as tentative. These cover, respectively, definitions of the terms "gross calorific value" and "net calorific value" of fuels, two methods of test for grindability of coal, and a new method of test for screen analysis of coal. This latter was developed and recommended to Committee D-5 by Subcommittee VII on Defining Coal Sizes and Friability of the technical committee on coal classification of the Sectional Committee on Classification of Coals.

Committee D-11 on Rubber proposed revisions of general methods of testing rubber products intended to apply mainly to soft-rubber vulcanized compounds.

New requirements for tension testing of vulcanized rubber and test methods for adhesion of vulcanized rubber were also recommended as new tentative standards.

The Committee on Metallography, E-4, has prepared an extensive revision of the Standard Methods of Metallographic Testing of Iron and Steel (E 3-24) and the Standard Methods of Metallographic Testing of Non-Ferrous Metals and Alloys (E 5-27). These two standards have been combined into a proposed Recommended Practice for Metallographic Testing of Ferrous and Non-Ferrous Metals which is to be published as tentative.

Colors Identify Danish Pipe Lines

Copies of a new Danish national standard specifying colors and identification letters for pipe lines have been received by the American Standards Association. The colors and identifying letters are to be used on drawings of piping installations, as well as on the piping itself. Pipe lines carrying water, steam, air, brine, lubricating oil, fuel oil, smoke, waste water, and seawater aboard ship are to be distinguished by different colors and letters according to the standard.

An American Recommended Practice for the identification of piping systems was developed in 1928 under the procedure of the American Standards Association for marking piping systems by American industry in order to distinguish pipes used for different purposes. This American Recommended Practice Scheme for the Identification of Piping Systems (A13-1928) was sponsored by the American Society of Mechanical Engineers and the National Safety Council.

Copies of the American standard are available from the American Standards Association at 50 cents each. A copy of the Danish standard can be borrowed or purchased from the ASA office. It is 30 cents per copy.

McBurney Reports Results of Research on Brick Resistance

A research paper on the relation of freezing and thawing resistance to physical properties of clay and shale brick was appended to the report of Committee C-3, which adopted as tentative a method of test for weathering of brick based on this research. The report was presented by J. W. McBurney, now a member of the American Standards Association staff with headquarters in Washington, formerly Research Associate of the Common Brick Manufacturers Association at the National Bureau of Standards. The laboratory work was completed in 1932. Mr. McBurney and D. E. Parsons, National Bureau of Standards, carried out the research program reported in the paper.

The conclusions reached, based on the extensive tests conducted, Mr. McBurney said, are that neither strength, water absorption, nor ratio of 48-hr cold-water absorption to 5-hr boiling-water absorption (C_{48}/B_5), considered separately, provide a practical means of predicting the resistance of clay or shale building brick to cycles of freezing and thawing.

Strength *and* water absorption in combination with the ratio 48-hr cold-water absorption to 5-hr boiling point absorption (C_{48}/B_5) provides the best separation of brick into resistant and non-resistant with respect to freezing-and-thawing cycles, it was concluded.

Australia Will Use British Sieve Standard

British Standard Specifications for test sieves have been adopted as standard for Australian use by the Standards Association of Australia.

The British Specification was prepared by a committee of the British Standards Institution which used the standard sieve series of the National Bureau of Standards in its research.

British standard sieves are divided into three series, fine and medium mesh sieves of woven wire cloth, and coarse mesh sieves of perforated metal plate.

Harrods Standardize Sizes For Fashion Merchandise

During the past few weeks a determined effort to standardize sizes throughout their range of women's fashion goods has been inaugurated by Harrods, Ltd. Uniform sizes for garments were prepared, the cooperation of manufacturers sought, and, after a great deal of work, the scheme was launched on February 1. Already its advantages are apparent.

When Richard Burbidge took over the position of managing director of the company a few weeks ago he said that the policy of the store was going to be "more service to the customer." This latest step in the name of "service" constitutes one of the most important made by any retailer during recent years.

T. Anthony, director and merchandise manager, said this question of sizes had been under review by the management for some time and they were much exercised in their minds as to why the percentage of alterations required in garments coming from the manufacturers was so large. The subject was thoroughly investigated, and the method of standardizing sizes adopted in America was closely studied. The practice in this country, where each manufacturer has his own sizes, compares poorly with the results obtained in the States. It was found that American sizes needed far fewer alterations after being delivered by the manufacturers than did ours.

Harrods' fashion departments were therefore thoroughly overhauled and the new system introduced. They now offer 25 sizes, ranging from junior misses to tall, stout women. These include some entirely new additions to the size range.

Mr. Anthony said that Harrods are asking manufacturers to cooperate with them and are agreeably surprised at the willingness with which their request has been taken up.

Standardizes on U. S. Forms

A further development in connection with the scheme is the purchase of a number of Bauman dress forms from America. These are said to conform much better with the lines of the human figure. "Although we have only had this system in force a few weeks we have already found alterations to garments are needed much less frequently."

It is hoped that, gradually, all manufacturers will come into line so that sizes will be uniform throughout instead of the present chaotic state being allowed to continue. In America, where the subject has received serious consideration, they have a bureau of standard sizes from which every manufacturer works. Mr. Anthony holds that if that could be done in this country manufacturers would find it of great convenience and a definite advance on the present system.

The actual methods adopted by Harrods are these:—The sizes are first given to the manufacturer when the garments are ordered and on delivery they are checked in the firm's own bureau of standards to ensure that they conform to those ordered. The quality and finish of the workmanship is also watched. If the coats, frocks or suits differ in any way from the orders given, the manufacturers are in formed of the errors.—*Draper's Record, London, March 16.*

Commercial Standard on Marking Silver and Gold Submitted to ASA

In accordance with the recommendation of the general conference which accepted the Commercial Standard for Marking Articles Made of Silver in Combination with Gold, CS51-35, under the procedure of the National Bureau of Standards, the standard has been submitted to the American Standards Association for approval.

The Jewelers Vigilance Committee requested the cooperation of the National Bureau of Standards in establishing this commercial standard in order to provide a definite means for comparison of quality by the consumer, and a basis for fair competition among producers and distributors. The standard is intended to eliminate such confusing markings as "10K and Sterling" on articles where the two metals are not distinguishable. In some cases, for example, such articles may contain 10 per cent gold, while in other cases they may contain 70 per cent gold.

Among other things, the standard provides that an article in which the parts made of the two metals are combined so as not to be visually separable or easily distinguished may carry a quality mark consisting of the words "Sterling and" or "Sterling +" followed by a fraction representing the proportion of the weight of the alloyed gold to the weight of the entire metal in the article, and a karat mark representing the actual karat fineness of the gold. A mark, for example, might read "Sterling and 1/5 10K" indicating that the article is made of four-fifths Sterling silver, and one-fifth 10-karat gold.

Other sections of the Commercial Standard outline the tolerances and the fineness of gold in such combinations, and indicate what other marks may appear on these articles.

Mimeographed copies of the proposed standard can be obtained from the National Bureau of Standards, Washington, D. C., or from the office of the American Standards Association.

Office Furniture Standardization Shows Resulting Economies

In 1933, there was presented to the Accounting Section of the American Gas Association a detailed report on the advantages of standardizing forms and printing. Less apparent, perhaps, but nevertheless of sufficient merit to warrant consideration are the advantages and economies to be had in the standardization of office furniture.

A general definition of standardization as applied to office furniture might be similarity in size, finish, and design, with only such variations as are absolutely essential to a particular need or particular job. Standardization implies and requires the concentration of the functions of selecting, purchasing, and maintaining furniture in one executive.

This centralization of responsibility for office furniture and equipment in one executive has in itself many advantages:

1. The executive becomes an authority on values and requirements and consequently is not likely to be misled or oversold by zealous salesmen.
2. The executive is able to acquire a fund of information with respect to the durability of, and cost of maintaining, present furniture and equipment, which information is useful in future dealings.
3. The executive is able to reduce expenditures for new furniture and equipment by virtue of his authority to take over items no longer used by one department to meet the requirements of another department or to provide a surplus stock.

Effect of Uniformity

The above advantages are not mere theory, but over a period of time will result in definite savings in maintenance expenditures and curtailment of unnecessary expenditures.

The psychological effect of uniformity in office furniture upon the personnel is an advantage accruing from standardization. It is now a generally recognized fact that office efficiency is to some extent related to office surroundings.

The well-ordered appearance of a place of business commands the respect of employees and visitors alike; it creates an atmosphere of well-organized activities and encourages the effort to maintain such an atmosphere. The financial benefit of the psychological effect of standardization and uniformity in office furniture cannot, of course, be accurately determined but it is a factor not to be overlooked by the wide-awake organization.

Standardization permits consolidation of departments and the transfer of personnel and their furniture from one department to another, without the loss of any of the benefits mentioned above. Such consolidations and transfers are a common problem, but from the furniture standpoint they cease to be a problem with standardized equipment. Experience has demonstrated that when an activity is discontinued for which non-standardized equipment has been used it is difficult to place the furniture and equipment so released in use in other branches of a company's organization; whereas, if the furniture and equipment so released is similar to that in general use, no difficulty is encountered in supplying it as it may be required to meet increasing needs in those departments whose work is continuing.

Another advantage of standardization is the simplicity of property record accounting through the reduction in the number of different items in use and ability to group the many similar items for pricing purposes.

By the simple expedient of setting up a standard group for its department heads, and a third group for general use, one large company has been able to avoid the irritating problem which is bound to arise when executives or department heads are permitted to select and purchase equipment for their own offices, and whose aim in each instance might be to obtain equipment just a little better or more attractive than that of another executive or department head.—*Philip J. Sweenie, The Peoples Gas Light and Coke Company, Chicago, Ill., in the American Gas Association Monthly, July, 1935.*

South Africa Requires Standard Electric Plugs

Cape Town, South Africa, has issued regulations providing that after September 1 standard wall plugs and sockets for electric ranges, made according to British Standard Specifications, must be fitted in all new houses, flats, and offices in the municipality. Areas in the Cape Province served by the Electricity Supply Commission will come under similar provisions, and other provinces are considering regulations of a like nature.

The change is being made to insure uniformity in electrical fittings, because at present there are numerous types and sizes of plugs.

Sweden Adopts Standard Specifications For Purchasing Army Lubricating Oil

A standard specification for lubricating oils has been adopted by the Swedish Government for use in buying oil for Army cars. The values in the specification were chosen partly by comparison with the U. S. Federal Specification of 1932, and partly on data from tests on motor oils available on the Swedish market.

Details are given in the standard for selecting suitable oils, taking into consideration the weight and load of the car, external temperature, etc.

The oils are divided into five groups according to their kinematic viscosity as shown in the chart below.

In addition, the s.g., flash point, cold tests, Conradson carbon test, and the Sligh oxidation test have been used in judging the practical suitability of the oil.

Experiments and research into quality of motor lubricating oils conducted at the Government Testing Institute of Sweden in connection with the development of the standard have been reported by E. Norlin, and Professor E. Hubendick.

Copies of the report (Report 64, Gov. Testing Institute, 1934) can be obtained through the American Standards Association Library.

	M.1.	M.2.	M.3.	M.4.	M.5.
S.G. (max.)	0.925	0.930	0.930	0.930	0.935
Kinematic vis. at 50° C.	30—45	55—70	80—95	105—125	135—170
Kinematic vis. at 100° C. min.	6	8.5	11	14	18
Flash Pt. (Pensky-Martin) °C. min.	170	180	190	200	200
Cold test °C.	—20	—10	—10	0	0
Conradson Carbon test % max.	0.3	0.7	0.8	1.0	1.5
Oxidation by Sligh-test, max.	20	20	15	15	10

Kinematic Viscosity of the Five Groups of Lubricating Oils Specified by the Swedish Government

F. Leo Smith

F. Leo Smith, chief architect of the technical division of the Federal Housing Administration, died July 21 at Washington. Mr. Smith, who had been ill for only a short time, was the first executive of the FHA to die since that agency was established. He was 42 years old.

Mr. Smith was an alternate on the Standards Council of the American Standards Association, which gives final approval to standards submitted to the ASA, representing the American Institute of Architects, from October 1931 to March 1932. He took an active part in the standardization work of the American Standards Association, representing the American Institute of Architects on 24 sectional committees, and representing the Federal Housing Administration on one of these committees. He was chairman of the Sectional Committee on Specifications for Plastering. The committees on which he worked covered the entire field of building interests, from building materials, safety codes and standards for construction of buildings, and for building equipment such as elevators, electrical installations, and refrigerators, to methods for testing wood, standard symbols and abbreviations, and construction of grandstands.

Mr. Smith was a native of Marion, Ohio. In 1924 he became associated with the Ohio Board of Building Standards, and the next year was made field engineer for the Portland Cement Association, continuing in that position until 1931. Since then he had served as technical secretary of the structural service division of the American Institute of Architects, holding that position at the time of his death.

He was called to Washington in 1933 to become assistant construction engineer for the housing division of the Public Works Administration, and continued there until the establishment of the FHA in August, 1934. Mr. Smith was credited with establishing the property standards set up by the housing administration.

Appliance Industry Starts Coal Research

A comprehensive program of standardization and research was started recently by the British coal-burning appliance industry in cooperation with the British Standards Institution.

A technical subcommittee of the Coal-Burning Appliance Makers' Association has been organized to standardize nomenclature and to consider rating and testing of appliances, to investigate the effect of coal grading on these appliances, to promote research in combustion and to collect data on performance. Standards for coal-burning appliances are now being prepared by the British Standards Institution, with the cooperation of the Coal-Burning Appliance Makers' Association.

The program which is being carried on by the Association includes sections dealing with traction, metallurgical, chemical, ceramic, and cleaning industries, and with driers, ovens, and brewers' equipment.

Coordination of investigations into the operation of domestic, industrial and marine appliances, as well as into fundamental problems of solid-fuel combustion is also being considered.

A generally agreed-upon nomenclature for the description of coal sizes would be of benefit to coal-burning appliance manufacturers and coal consumers, it is believed.

Hoffman Discusses Safety Legislation Before AMA

Paul G. Hoffman, president of the Studebaker Corporation, was the principal speaker at the spring session of the Automobile Manufacturers Association in New York recently. As chairman of the Association's Traffic Safety Committee, he spoke on the subject "Safety Legislation Affecting Motor Vehicles."

Mr. Hoffman was appointed one of the AMA representatives on the steering committee of the Motor Vehicle Safety Conference, to study the proposal that the American Standards Association develop standards for the safety inspection of cars, trucks, and buses.

William W. Wysor

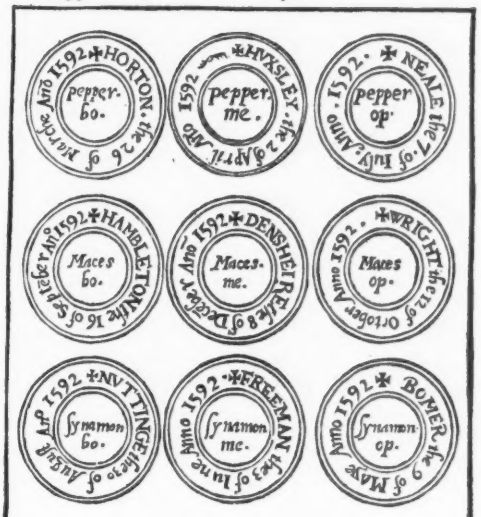
William W. Wysor, chief engineer of the United Railways & Electric Company of Baltimore, died July 1 at his home. He was 47. A nationally known transit engineer, he represented the American Electric Railway Association as a member of Standards Council of the American Standards Association from 1927 to 1931.

Four years ago he served as president of the American Electric Railway Engineering Association, now the American Transit Engineering Association. He was a former president of the Engineers Club of Baltimore.

Certification and Labeling – 1592 A.D.

for Garbelling.

the same marke with his name, may be set vpon the top of the bag, or other vessell; shewing thereby the deuision and sorte therein contained, and the goodnes therof (notwithstanding the seale of the garbeller to be vsed at his pleasure) the which marke may passe with *Bonus, melior, optimus*, according to the thing garbelled, as thus for an example.



The above illustration shows a page from a rare volume ambiguously entitled "A Profitable and Necessarie Discourse," which describes in detail how grocers of London graded, certified, and labeled spices nearly 400 years ago.

Note the three grades, "good," "better," and "best," (abbreviated from the Latin *bonus, melior, optimus)* together with the name of the spice, the name of the grocery company or packer, and the date. These seals were issued by authority of the trade guild.

The title page of the book points out that the sale of inferior spices was against the interest of the industry and "contrarie unto the common good."

A Manual of

AMERICAN STANDARDS

Approved by the

AMERICAN STANDARDS ASSOCIATION

ASA

Indexed List of Engineering and Industrial Standards and Safety Codes

A—CIVIL ENGINEERING

		Price
A1a-1931	Portland Cement, Specifications (ASTM C9-30)	.25
A1.2-1933	Portland Cement, Methods of Sampling and Testing (ASTM C77-32)	.25
A2-1934	Specifications for Fire Tests of Building Construction and Materials (ASTM C19-33)	.25
A5-1930	Toughness of Rock, Method of Test for (ASTM D3-18)	.25
A6-1925	Drain Tile, Specifications for (ASTM C4-24)	.25
A9-1935	Building Exits Code	.75
A10-1934	Safety in the Construction Industry ("Manual of Accident Prevention in Construction", by Associated General Contractors of America)	2.00
A11-1930	Lighting Factories, Mills and Other Work Places, Code of (Lab. Stat. Bull. 556)	.20
A12-1932	Floor and Wall Openings, Railings and Toe Boards, Safety Code for	.20
A13-1928	Identification of Piping Systems, Scheme for	.50
A14-1935	Safety Code for the Construction, Care and Use of Ladders	.25
A17-1931	Elevators, Dumbwaiters and Escalators, Safety Code for	1.00
A19-1923	Voids in Fine Aggregate for Concrete, Method of Test for (ASTM C30-22)	.25
A23-1932	School Lighting, Standards of	.20
A26-1930	Stone, Slag, Gravel, Sand and Stone Block for Use as Highway Materials, Methods of Sampling (ASTM D75-22)	.25
A27-1924	Apparent Specific Gravity of Coarse Aggregates, Method of Test for (ASTM D30-18)	.25
A31-1924	Materials for Cement Grout Filler for Brick and Stone Block Pavements, Specifications for (ASTM D57-20)	.25
A37.1-1930	Penetration of Bituminous Materials, Method of Test for (ASTM D5-25)	.25
A37.2-1930	Bituminous Materials, Method of Float Test for (ASTM D139-27)	.25
A37.3-1930	Determination of Bitumen, Method of Test for (ASTM D4-27)	.25
A38-1933	Steel Reinforcing Spirals (SPR 53-32)	.05
A39-1933	Window Cleaning, Safety Code for	.20
A47-1932	Steel Reinforcing Bars (SPR 26-30)	.05
A48-1932	Forms for Concrete Joist Construction Floors (SPR 87-32)	.05
A49.1-1933	Gypsum, Specifications for (ASTM C22-25)	.25
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A49.3-1933	Gypsum Plasters, Specifications for (ASTM C28-30)	.25
A49.4-1933	Gypsum Molding Plaster, Specifications for (ASTM C59-30)	.25
A49.5-1933	Gypsum Pottery Plaster, Specifications for (ASTM C60-30)	.25

For standard abbreviations and symbols in civil engineering, see serial no. Z10.

B—MECHANICAL ENGINEERING

B1.1-1935	Screw Threads	.65
B2-1919	Pipe Threads	.40
B4a-1925	Tolerances, Allowances and Gages for Metal Fits	.50
B5a-1927	T-Slots, Their Bolts, Nuts, Tongues and Cutters, Dimensions of	.35
B5b-1929	Tool Holder Shanks and Tool Post Openings, Dimensions of	.25
B5c-1930	Milling Cutters	.75
B5e-1930	Taps; Cut and Ground Threads	.50
B5.5-1932	Rotating Air Cylinders and Adapters	.35
B5.6-1935	Jig Bushings	.35
B6.1-1932	Spur Gear Tooth Form	.45

(See next page for explanation of abbreviations and keying)

Explanation of abbreviations used in cross references

AIEE American Institute of Electrical Engineers
API American Petroleum Institute
ASTM American Society for Testing Materials
Bur. Stds. Bureau of Standards
FS Federal Specification
Lab.Stat.Bull. United States Bureau of Labor Statistics Bulletin
CS Commercial Standard
SPR Simplified Practice Recommendation
Bur.Mines TP Bureau of Mines Technical Paper

		Price
B6.2-1933	Gear Materials and Blanks	.50
B7-1935	Abrasive Wheels, Safety Code for the Use, Care and Protection of	.10
B8-1932	Protection of Industrial Workers in Foundries, Safety Code for	.20
B9-1933	Mechanical Refrigeration, Safety Code for	.30
B11-1926	Power Presses and Foot and Hand Presses, Safety Code for (Lab. Stat. Bull. 430)	.20
B13-1924	Logging and Sawmill Safety Code. (Bur. Stds. Handbook 5)	.60
B15-1927	Mechanical Power Transmission Apparatus, Safety Code for	.35
B16a-1928	Cast Iron Pipe Flanges and Flanged Fittings for Maximum WSP of 125 lbs	.50
B16b-1928	Cast Iron Pipe Flanges and Flanged Fittings for Maximum WSP of 250 lbs	.50
B16b1-1931	Cast Iron Pipe Flanges and Flanged Fittings for 800 lbs Hydraulic Pressure	.35
B16b2-1931	Cast Iron Pipe Flanges and Flanged Fittings for Maximum WSP of 25 lbs	.40
B16c-1927	Malleable Iron Screwed Fittings for Maximum WSP of 150 lbs	.40
B16d-1927	Cast Iron Screwed Fittings for Maximum WSP of 125 and 250 lbs	.35
B16e-1932	Steel Flanged Fittings and Companion Flanges	.65
B16g-1929	Cast Iron Long Turn Sprinkler Fittings	.50
B17c-1927	Transmission Shafting, Code for Design of	.75
B17f-1930	Woodruff Keys, Keyslots and Cutters	.35
B17.1-1934	Shafting and Stock Keys	.45
B18a-1927	Small Rivets	.30
B18c-1930	Slotted Head Proportions, Machine Screws, Cap Screws and Wood Screws	.45
B18d-1930	Track Bolts and Nuts	.40
B18e-1928	Round Unslotted Head Bolts, Dimensions of	.40
B18f-1928	Plow Bolts, Dimensions of	.35
B18g-1929	Tinners', Coopers' and Belt Rivets	.35
B18.2-1933	Wrench-Head Bolts and Nuts and Wrench Openings	.50
B24-1927	Forging and Hot Metal Stamping, Safety Code for (Lab. Stat. Bull. 451)	.15
B26-1925	Fire Hose Coupling Screw Thread	.25
B28a-1927	Rubber Mills and Calendars, Safety Code for (Lab. Stat. Bull. 447)	.05
B29a-1930	Roller Chains, Sprockets and Cutters	Out of print
B31.1-1935	Code for Pressure Piping	1.00
B36.1-1934	Welded and Seamless Steel Pipe (ASTM A53-33)	.25
B36.2-1934	Welded Wrought-Iron Pipe (ASTM A72-33)	.25
B36.3-1934	Lap-Welded and Seamless Steel Pipe for High-Temperature Service (ASTM A106-33T)	.25
B36.4-1934	Electric-Fusion-Welded Steel Pipe (Sizes 30 in. and over) (ASTM A134-32T)	.25
B36.5-1935	Electric-Resistance-Welded Steel Pipe (ASTM A135-34)	.25
B36.6-1934	Forge-Welded Steel Pipe (ASTM A136-32T)	.25
B36.7-1935	Lock-Bar Steel Pipe (ASTM A137-34)	.25
B36.8-1935	Riveted Steel and Wrought-Iron Pipe (ASTM A138-34)	.25
B36.9-1934	Electric-Fusion-Welded Steel Pipe (Sizes 8 in. to but not including 30 in.) (ASTM A139-32T)	.25

		Price
B38c1-1931	Testing Domestic Refrigerators Using Ice, Code for	.20
B45.1-1932	Foundry Patterns of Wood (CS 19-32)	.10
B47-1933	Plain and Thread Plug and Ring Gage Blanks (CS 8-33)	.10
B48.1-1933	Inch-Millimeter Conversion for Industrial Use	.20
B49-1932	Shaft Couplings, Integrally Forged Flange Type for Hydro-Electric Units	.35

For standard abbreviations and symbols in mechanical engineering, see serial no. Z10.

C—ELECTRICAL ENGINEERING

C1-1933	Electric Wiring and Apparatus in Relation to Fire Hazard (National Electrical Code)	.05
C2-1927	National Electrical Safety Code (Bur. Stds. Handbook 3)	Out of print
	The information contained in this code is available in the following separate publications:	
	Handbook 6—Installation and Maintenance of Electrical Supply Stations	.10
	Handbook 7—Installation and Maintenance of Electric Utilization Equipment	.15
	Handbook 8—Safety Rules for the Operation of Electrical Equipment and Lines	.15
	Handbook 9—Safety Rules for Radio Installations	.10
	Handbook 10—Installation and Maintenance of Electrical Supply and Communication Lines	.60
	Handbook 16—Wood Poles for Overhead Electrical Lines	.10
C5.1-1933	Code for Protection Against Lightning	
	Part I, Protection of Persons	
C5.2-1933	Part II, Protection of Buildings and Miscellaneous Property	
C5.3-1929	Part III, Protection of Structures Containing Inflammable Liquids and Gases	
	Published in one pamphlet (Bur. Stds. Handbook 17)	.15
C8a-1932	Definitions and General Standards for Wires and Cables (AIEE 30-1932)	.40
C8b1-1928	Tinned Soft or Annealed Copper Wire for Rubber Insulation, Specifications for (Also pub. as H16-1928) (AIEE 60, 61-1928; ASTM B33-21)	.30
C8b2-1928	Soft or Annealed Copper Wire, Specifications for (Also pub. as H4-1928) (AIEE 60, 61-1928; ASTM B3-27)	
C8d1-1928	30% Rubber Insulation for Wire and Cable for General Purposes, Specifications for (AIEE 63-1928)	.30
C8j1-1928	Cotton Covered Round Copper Magnet Wire, Specifications for (AIEE 69-1928)	.30
C8j2-1928	Silk Covered Round Copper Magnet Wire, Specifications for (AIEE 70-1929)	
C8j3-1928	Enameled Round Copper Magnet Wire, Specifications for (AIEE 71-1928)	

(See beginning of list for explanation of abbreviations and keying)

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(Due to the cost of billing and carrying charge accounts on small items, will you please enclose your remittance with your order? Your cooperation will be much appreciated. Members of ASA may deduct 20 per cent discount in sending remittances for standards.)

		Price
C8k1-1932	Weatherproof (Weather Resisting) Wires and Cables (AIEE 72-1932)	.20
C8k2-1932	Heat Resisting Wires and Cables (AIEE 73-1932)	
C8.10-1933[1]	Impregnated Paper Insulation for Lead Covered Power Cables (mimeographed)	.15
C8.11-1933[1]	Code Rubber Insulation for Wire and Cable for General Purposes, Specifications for (mimeographed)	.15
C8.12-1935[1]	Specifications for Cotton Braid for Insulated Wires and Cables (mimeographed)	.15
C10-1924	Electrical Equipment of Buildings, Standards Symbols for (AIEE 42-1923)	.20
C11-1927	Hard Drawn Aluminum Conductors, Physical and Electrical Constants for (AIEE 46-1927)	.20
C12-1928	Electricity Meters, Code for	.50
C13-1926	Tubular Steel Poles, Specifications for	.25
C15-1935	750 Volt Direct Suspension Overhead Trolley Contact Construction	Out of print
C18-1930	Dry Cells and Batteries, Specifications for (FS W-B-101)	.15
C19-1928	Industrial Control Apparatus, Definitions, Classifications, Rating and Methods of Test for (AIEE 15-1928)	.40
C21-1926	Synchronous Converters, Definitions, Classifications, Rating and Methods of Test for (AIEE 8-1925)	.40
C22-1925	Instrument Transformers, Definitions, Classification, Rating and Methods of Test for (AIEE 14-1925)	.30
C29a-1930	Insulator Tests (AIEE 41-1930)	.30
C33a-1929	Outlet Boxes, Standard	.25
C35-1928	Railway Motors (AIEE 11-1925)	.30
C40-1928	Storage Batteries, Definitions, Classification, Rating and Method of Test for (AIEE 36-1928)	.20
C44-1931	Rolled Threads for Screw Shells of Electric Sockets and Lamp Bases	.35
C48-1931	Electric Railway Control Apparatus, Standards for (AIEE 16-1933)	.40
C50c1-1928	Induction Motors and Induction Machines in General, Rating Provisions for (Separate publication deferred) (AIEE 9-1927. rating paragraphs 9-61, 157, 500, 501, 502)	.40
C52.1-1933	Electric Arc Welding Apparatus	.40
C52.2-1933	Resistance Welding Apparatus	.30
C53-1932	Recommended Practice in the Temperature Operation of Transformers (AIEE 100-1930)	.20
C55-1934	Capacitors, Standards for (AIEE 18-1934)	.20
C57.1-1933	Constant Current Transformers, Standards for	.30
C59.1-1935	Methods of Testing Molded Materials Used for Electrical Insulation (ASTM D48-33)	.25
C59.2-1935	Methods of Testing Electrical Insulating Oils (ASTM D117-33)	.25
C59.3-1935	Methods of Test for Resistivity of Insulating Materials (ASTM D257-33)	.25
C59.4-1935	Specifications for Rubber Matting for Use Around Electrical Apparatus or Circuits Not Exceeding 3000 Volts to Ground (ASTM D178-24)	.25

[1]Mimeographed copies issued for use until committee completes work and issues printed copies.

For standard abbreviations and symbols in electrical engineering, see serial no. Z10.

D—AUTOMOTIVE (AUTOMOBILE AND AIRCRAFT)

D1-1925	Aeronautic Safety Code	1.50
D3-1927	Colors for Traffic Signals, Safety Code for	.25
D4-1927	Brakes and Brake Testing, Safety Code for (Bur. Stds. Misc. Pub. 107)	.05

E—TRANSPORTATION

E2-1923	Design for Joint Plates for Seven-Inch Girder-Grooved and Guard Rails	.20
E3-1923	Design for Joint Plates for Nine-Inch Girder-Grooved and Guard Rails	.20
E4-1933	Design for Seven-Inch Girder-Grooved Rail	.10
E5-1933	Design for Nine-Inch Girder-Grooved Rail	.10
E6-1933	Design for Seven-Inch Girder Guard Rail	.10
E7-1933	Design for Nine-Inch Girder Guard Rail	.10
E8-1933	Seven-Inch, 82 lb Plain Girder Rail and Splice Bars	.10
E9-1933	Seven-Inch, 92 lb Plain Girder Rail and Splice Bars	.10
E10-1929	Special Track Work Materials, Specifications for	.25
E11-1933	Seven-Inch, 102 lb Plain Girder Rail and Splice Bars	.10

G—FERROUS METALLURGY

G8b1-1931	Zinc-Coated (galvanized) Sheets (ASTM A93-27)	.25
G8.1-1933	Zinc Coatings on Structural Steel Shapes, Plates and Bars and Their Products, Specifications for (ASTM A123-33)	.25
G9.1-1933	Carbon-Steel and Alloy-Steel Blooms, Billets and Slabs for Forgings, Specifications for (ASTM A17-29)	.25
G12-1931	Refined Wrought-Iron Bars, Specifications for (ASTM A41-30)	.25
G13-1931	Wrought-Iron Plates, Specifications for (ASTM A42-30)	.25
G17.1-1934	Specifications for Carbon-Steel Castings for Valves, Flanges and Fittings for High-Temperature Service (ASTM A95-33)	.25

Price of Complete Set of Approved American Standards—**$75.00**

(This does not include standards issued since the publication of this list.)

(See beginning of list for explanation of abbreviations and keying)

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G17.2-1934	Specifications for Alloy-Steel Bolting Material for High-Temperature Service (ASTM A96-33)	.25
G17.3-1934	Specifications for Forged or Rolled Steel Pipe Flanges for High-Temperature Service (ASTM A105-33)	.25

H—NON-FERROUS METALLURGY

H4-1928	Soft or Annealed Copper Wire, Specifications for (ASTM B3-27; AIEE 61-1928)	See C8b2-1928
H7-1925	Brass Forging Rod, Specifications for (ASTM B15-18)	.25
H8-1934	Specifications for Free-Cutting Brass Rod for Use in Screw Machines (ASTM B16-29)	.25
H11-1924	Solder Metal, Specifications for (ASTM B32-21)	.25
H13-1925	Plumbago Crucibles for Non-Tilting Furnaces in Non-Ferrous Foundry Practice, Outside Dimensions of	.20
H14-1929	Hard-Drawn Copper Wire, Specifications for (ASTM B1-27)	.25
H16-1928	Tinned Soft or Annealed Copper Wire for Rubber Insulation, Specifications for (ASTM B33-21; AIEE 60-1928)	See C8b1-1928
H17.1-1932	Lake Copper Wire Bars, Cakes, Slabs, Billets, Ingots and Ingot Bars, Specifications for (ASTM B4-27)	.25
H17.2-1932	Electrolytic Copper Wire Bars, Cakes, Slabs, Billets, Ingots and Ingot Bars, Specifications for (ASTM B5-27)	.25
H23.1-1934	Specifications for Copper Water Tube (ASTM B88-33)	.25

K—CHEMICAL INDUSTRY

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K3-1921	Manganese Bronze, Methods of Chemical Analysis of (ASTM B27-19)	.25
K4-1921	Gun Metal, Methods of Chemical Analysis of (ASTM B28-19)	.25
K5-1922	Alloys of Lead, Tin, Antimony and Copper, Methods of Chemical Analysis of (ASTM B18-21)	.25
K12-1921	Battery Assay of Copper, Methods of (ASTM B34-20)	.25
K13-1930	Gas-Mask Canisters, Code for Identification (Lab. Stat. Bul. 512)	.05
K14-1930	Liquid Soap, Specifications for (FSB 27; also FS P-S-618)	.05
K15-1933	White Pigments, Methods of Routine Analysis of (ASTM D34-33)	.25
K16-1933	Dry Red Lead, Methods of Routine Analysis of (ASTM D49-33)	.25
K18-1933	Coal and Coke, Methods of Laboratory Sampling and Analysis (ASTM D271-33)	.25

L—TEXTILE INDUSTRY

L1-1929	Textile Safety Code (Lab. Stat. Bull. 509)	.05
L3-1931	Cotton Rubber-Lined Fire Hose, Specifications for (ASTM D296-31T)	.25
L5-1934	Woven Textile Fabrics, Methods of Testing (ASTM D39-34)	.25

M—MINING

M2-1926	Installing and Using Electrical Equipment in Coal Mines, Safety Rules for (Bur. Mines TP 402)	.05
M5-1932	Screen Testing of Ores (hand method), Methods for	.25
M6-1931	Drainage of Coal Mines, Recommended Practice for	.40
M7.1-1933	Frogs, Switches and Turnouts for Coal Mine Tracks (20 to 60 lb rail)	In press
M7.2-1935	Frogs, Switches and Turnouts for Coal Mine Tracks for 70 lb. and 80 lb Rail	In Press
M10-1928	Miscellaneous Outside Coal Handling Equipment, Recommended Practice for	.25
M11-1927	Wire Rope for Mines, Specifications and Recommended Practice in Use at Mines	.25
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(Separate copies of Z12f-1931 are also available at 10c each)

Z12.1-1935	Safety Code for the Installation of Pulverized Fuel Systems	In press
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CS50-34	Binders Board for Book Binding and Other Purposes	.05

REPORTS, DISCUSSIONS AND DRAFT STANDARDS FOR SALE

(These are NOT approved American Standards)

	Discussion of National Electrical Safety Code (C2-1927; Bur. Stds. Handbook 4)	1.00
	Preliminary Report on "Protection of Electrical Circuits and Equipment against Lightning" (Bur. Stds. Misc. Pub. 95, Parts IV and V)	.25
C42	Report on Proposed American Standard Definitions of Electrical Terms (preliminary draft)	1.00
C50	Rotating Electrical Machinery (draft of proposed American Standard published for general comment and criticism)	.25
M20	Classification of coals (preliminary draft; ASTM 1934 Preprint)	.25
Z17	Preferred Numbers, Table of (informally approved and recommended to industry for a period of trial in practice)	.20

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